SECTION 23 2300

REFRIGERANT PIPING

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LANL MASTER SPECIFICATION

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the ESM Mechanical POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within “stars” during editing.

Specification developed for ML-3 / ML-4 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Site and building refrigerant piping, fittings, and refrigeration specialties.

1.2 SUBMITTALS

A. Submit the following in accordance with Section 01 3300, Submittal Procedures:

1. Catalog Data:

   a. Data on pipe materials, fittings, and accessories.

   b. Refrigerant Specialties: Manufacturers catalog information including capacity, component sizes, rough-in requirements, etc.

2. Manufacturer's Installation Instructions: Submit hanging and support methods, joining procedures and isolation.

3. Certification of welders

1.3 QUALITY ASSURANCE

A. Comply with ASME B31.5, Refrigeration Piping.

PART 2 PRODUCTS

2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Alternate products may be accepted; follow Section 01 2500, Substitution Procedures.

2.2 REFRIGERANT PIPING

A. Copper Tubing: ASTM B280, Type ACR hard drawn [or annealed].

B. Fittings: ASME B16.22 wrought copper.

C. Joints: Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy with melting range 1190 to 1480 degrees F

2.3 UNIONS, FLANGES, AND COUPLINGS

A. 2 inches and Smaller:

1. Copper Pipe: Bronze, soldered joints.

B. 2-1/2 inches and Larger:

1. Copper Piping: Bronze, flanged joints.

2. Gaskets: 1/16 inch thick preformed neoprene.

C. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.4 REFRIGERANT SPECIALTIES

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Specify required refrigeration specialties such as filter-dryers, solenoid valves, expansion valves, moisture and liquid indicators, strainers, pressure regulators, etc., to suit project.
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PART 3 EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.2 BURIED PIPING

A. Provide earth cover, bedding, and warning tape per Drawings and Section 31 2000, Earth Moving.

3.3 INSTALLATION

A. Where more than one piping system material is specified, provide compatible system components and joints. Use non-conducting dielectric connections when joining dissimilar metals in systems.

B. Provide flanges, unions, or couplings at locations requiring servicing. Use unions, flanges, or couplings downstream of valves and at equipment connections. Do not use direct welded or threaded connections to valves or equipment.

C. Provide flexible connectors at or near equipment where piping configuration does not absorb vibration.

D. Install flexible connectors at right angles to axial movement of compressor, parallel to crankshaft.

E. Route piping parallel to building structure and maintain gradient.

F. Install piping to conserve building space, and not interfere with use of space.

G. Group piping whenever practical at common elevations.

H. Sleeve pipe passing through partitions, walls and floors. Provide UL/FM approved through penetration fire stop system when penetrating a fire rated barrier (i.e., wall, floors, etc.).

I. Label piping in accordance with Section 22 0554, Identification for Plumbing, HVAC, and Fire Piping and Equipment.

J. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

K. Provide access where valves and fittings are not exposed.

L. Arrange refrigerant piping to return oil to compressor. Provide traps and loops in piping, and provide double risers as required. Slope horizontal piping 1/2 inch in 10 feet in direction of flow.

M. Flood refrigerant piping system with nitrogen when brazing.

N. Install valves with stems upright or horizontal, not inverted.

O. Support piping in accordance with Section 22 0529, Hangers and Supports for Plumbing Piping and Equipment.

P. Pressure test piping in accordance with Section 22 0813, Testing Piping Systems.

Q. Insulate piping in accordance with Section 22 0713, Plumbing and HVAC Insulation.

R. Provide replaceable cartridge filter-dryers, with isolation valves and bypass with valve.

S. Locate expansion valve sensing bulb immediately downstream of evaporator on suction line.

T. Provide external equalizer piping on expansion valves with refrigerant distributor connected to evaporator.

U. Provide electrical connection to solenoid valves.

V. Fully charge completed system with refrigerant after testing.

W. Comply with ASHRAE 15 procedures for charging and purging of systems and for disposal of refrigerant.

END OF SECTION

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Do not delete the following reference information:

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FOR LANL USE ONLY

This project specification is based on LANL Master Specification 23 2300 Rev. 0, dated January 6, 2006.